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10/777,680	02/13/2004	Nobuyuki Eto	Q79867	5870

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EXAMINER	
LAZORCIK, JASON L	

ART UNIT	PAPER NUMBER
1741	

NOTIFICATION DATE	DELIVERY MODE
12/28/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/777,680	ETO ET AL.	
	Examiner	Art Unit	
	JASON L. LAZORCIK	1741	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 October 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,6,7 and 9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-4, 6-7 and 9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

State of the Claims

Applicants reply dated October 25, 2010 amends independent claim 1 and adds new claim 9.

Claims 1-9 have been presented in the instant Application. Claims 2, 5, and 8 have been cancelled by Applicant and no claim stand as withdrawn from consideration. Therefore, claims 1, 3-4, 6-7 and 9 are pending for prosecution on the merits.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3-4, and 6-7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aratani (US 4,671,814) in view of Takahashi (US 6,119,483), Morehouse (US 5,379,171), and Lenhart (US 4,803,106).

Aratani teaches a method for strengthening a glass substrate having a thickness of about 1.0mm by chemical strengthening. As set forth in Example 1 (Column 8, Lines 39-53), the immediate reference teaches that,

> "The sample disks were immersed in a bath of molten sodium nitrate...The sample disks taken up from the bath were left to cool down and were washed with water to remove adherent sodium nitrate and dried.
>
> After the above treatment with sodium nitrate, all the sample disks were immersed in a bath of molten potassium nitrate....The samples taken up from the molten potassium were left to cool down, washed and dried."

The Aratani disclosure sets forth a two step process wherein a glass substrate is subjected to a process with a first alkali ion of a first molten salt containing only sodium nitrate and followed with a subsequent treatment using a second alkali ion of a second molten salt containing only potassium nitrate. Applicant is advised that the claimed effect upon compressive stress at the surface of the substrate and tensile stress at an interior depth of the substrate are understood implicitly to follow from the disclosed process (see discussion pages 5-6, Official Action dated April 13, 2009).

It is further noted that the prior art reference teaches ranges for the first and second step process times and temperatures (col. 6, lines 37-68) which overlap

Applicants preferred conditions (see Specification ¶[0070-0073]). Again, absent compelling evidence to the contrary, the recited effect upon compressive and tensile stresses in the glass substrate are construed to follow naturally from the Aratani disclosed process.

Regarding claim 9, it is the Examiners assessment that the chemical strengthening step would reasonably be construed to be substantially uniformly carried out upon the surface of the glass substrate because the substrates are completely immersed within the molten salt bath. It follows that the chemical treatment would likewise be expected to proceed substantially without causing non-uniformities upon the surface of the glass substrate. Alternately, it is the Examiners assessment the general elimination of surface non-uniformities in the treated surface of the substrate would have fallen within the scope of routine experimentation and optimization for a skilled technician in the arts at the time of the invention through the course of routine quality control endeavors.

(I) Aratani is silent regarding the specific ion exchange steps as recited in claim 1 or composition of the glass substrate as recited in Claim 3.

Regarding the composition of the glass substrate, Aratani states that the chemical composition of the glass for use in the present invention "is not particularly limited and may belong to soda-lime-silicate glass, boro-silicate glass or alumino-silicate

glass, or to a still different type of glass" (Col. 5, lines 27-32). Aratani later explicitly teaches that it is preferable to utilize "a lithium salt when the principal alkali metal in the glass composition is lithium" and that "it is also possible to use a mixture of a sodium salt or sodium salts and a lithium salt or lithium salts". It follows that although Aratani is silent regarding the particular lithium-aluminosilicate glass as recited in Applicants claimed invention, such compositions of glass have been expressly considered by the inventors for use in the Aratani disclosed process.

(II) Applicants recited glass composition would have been obvious in view of the Takahashi disclosed process.

The reference to Takahashi discloses a closely related method for chemically strengthening a glass substrate by immersion in molten sodium and potassium nitrate salts wherein said strengthened substrate may be employed for use as a magnetic disk substrate.

With respect to **claim 3**, the Takahashi reference teaches that an aluminosilicate glass to be used for chemical reinforcement contains as principle components 57 to 74% SiO_2, 3 to 15% of Al_2O_3, 7 to 16% of Li_2O and 4 to 14% of Na_2O, each in terms of mole percent (Column 9, Lines 25-31). The reference continues with a preferred example of ~67% SiO_2, ~1% ZnO_2, ~9%Al_2O_3, ~12%Li_2O and ~10%Na_2O, each in

terms of mole %. The cited example composition for the aluminosilicate glass reads directly upon the claimed concentration ranges for each constituent.

Since Aratani explicitly teaches that the disclosed process may be used with lithium aluminosiicate glasses, one of ordinary skill in the art would have found it merely obvious to employ the Takahashi disclosed glass composition in the chemical strengthening process according to Aratani.

(III) The recited ion exchange process would follow naturally from treating the Takahashi glass substrate by the Aratani disclosed two step ion exchange process

Where the use of the Takahashi disclosed lithium aluminosilicate glass in the Aratani process constitutes an obvious extension over the prior art for reasons noted above, it is the Examiners assessment, absent compelling evidence to the contrary, that Applicants recited order of ion exchange (e.g. claim 1, lines 4-10) would flow naturally from the noted prior art modification. That is, the noted prior art combination is understood to employ substantially similar glass composition under treatment conditions which overlap Applicants disclosed preferred conditions, and therefore one skilled in the art would expect a substantially identical ion exchange behavior to that set forth in Applicants originally filed Specification.

Specifically, subjecting the lithium aluminosilicate glass of Takahashi to a first treatment of only sodium ions in accordance with the Aratani disclosure is expected to exchange at least some lithium ions in the substrate with sodium ions in the treatment

material. Similarly, a subsequent treatment of the sodium treated substrate would be expected to result at least in a partial substitution of the substrate sodium ions with potassium ions in the treatment material. Additional support for this position may be found in col. 1, lines 30-47 of the Aratani disclosure .

Regarding **Claim 6**, Takahashi indicates that "the magnetic disk is produced by forming a thin film such as a magnetic layer on a substrate and as the substrate for it,...(a) glass substrate has been employed" (Column 1, Lines 21-23)

(IV) The prior art is silent regarding the use of glass substrates having a diameter of not greater than 65mm as recited in claim 1, line 15 or a thickness in the range as recited in claims 4 and 7

As set forth above, the collective prior art references teach every element of the Applicants parent claim 1. Specifically, Takahashi teaches that it is known to subject glass substrates of the claimed composition to a chemical strengthening operation when preparing a magnetic hard drive substrate. Aratani teaches that it is known to use Applicants claimed sequential, two-stage salt bath technique when chemically tempering a glass substrate in order to minimize deformation of the substrate. Takahashi teaches a specific embodiment wherein the glass disks have a thickness of 1.5 mm, and Aratani teaches substrates having a thickness of "about 1.0mm".

As indicated in previous Office Actions dated November 1, 2007 and August 21, 2007, it is the Examiners position, in light of the Takahashi and Aratani disclosures, that the use of a substrate with a thickness of "0.2 to 0.9mm" or "0.2 to 0.6mm" represents a merely an obvious extension over the prior art of record. Specifically, Takahashi teaches the use of glass substrates having a thickness nearly equivalent to Applicants claimed thickness and Aratani teaches that the chemical tempering operation is applicable to substrates having a thickness of "about 1.0mm" thick. One having no more than an ordinary level of skill would have reasonably construed glass sheets of 0.9 or 0.6mm thickness as "about" 1.0mm or at least have found it obvious to try glass sheets of such a thickness.

This point not withstanding, neither of the cited references explicitly teaches the use of a glass substrate within the claimed thickness ranges.

(IV) Use of Applicants claimed glass substrate diameter and thickness values would have been obvious in view of the United States patent to Morehouse

The United States patent to Morehouse et. al. teaches the detailed construction of a magnetic hard drive device.

With respect to the outer diameter and thickness of the disk, Morehouse teaches that (Column 43, lines 35-47);

"Magnetic recording disk 10 comprises a thin film surface, with coercivity greater than 1500 Oe, coated with materials such as Co--Ni or Co--Cr--Ta alloys, applied to both sides of a rigid substrate by methods such as RF sputtering or plating. The substrate used with magnetic recording disk 10 is preferably about 0.445 mm thick, with very flat, smooth, surfaces and with good mechanical rigidity. Examples of suitable substrate materials are aluminum alloys, glass and ceramic materials. Disk 10 has an outer diameter of about 33.5mm..." (emphasis added)

As evidenced by the Morehouse reference, the use of a glass substrate having an outer diameter of about 33.5mm, which is in the claimed range of "not greater than 65mm" as recited in claim 1, line 15, a thickness of 0.445mm which is in the range of 0.2 to 0.9 mm [Claim 4], or alternately from 0.2 to 0.6mm thick [Claim 7], is known in the art of hard drive manufacture. In view of the instant disclosure, the use of a substrate of the claimed diameter and thickness would be considered obvious to one of ordinary skill in the art at the time of the invention.

(V) The prior art of record is silent regarding the step of mirror-polishing the substrate before chemically strengthening the substrate.

As noted above, Aritani a step for the chemical strengthening of glass substrates comprising a two stage immersion in separate molten salt baths. Aritani notes that the method is particularly relevant to the strengthening of float glass substrates that include

a diffused tin layer on one surface of the substrate and which by virtue of said diffused tin layer are particularly susceptible to deleterious warping during the chemical treatment process. One particular application which is explicitly noted by Aritani is the desired use of float glass substrates to the manufacture of glass information disks for electronic applications (col. 1, lines 55-col.2, line 2).

(VI) The step of mirror polishing before chemical strengthening would have constituted an obvious advance over the prior art of record in view of the United States Patent to Lenhart (US 4,803,106).

The reference to Lenhart teaches a method for manufacturing a chemically strengthened glass substrate for use as an information recording medium in electronic devices. Similar to the Aritani and Takahashi disclosures above, Lenhart teaches that a glass disc may be manufactured from a float glass substrate (col. 4, lines 1-4) and that the resultant disc is thereafter strengthened by immersion in a molten salt bath. Of particular note, Lenhart discloses that at least one surface of the float glass substrate must be polished to a mirror smooth finish in order to meet the strict operating tolerances of the read head in the information device (col. 1, lines 48-53). Further, Lenhart teaches that such a planarization and mirror polishing step should be carried out before subjecting the substrate to the molten salt strengthening step (see col. 4, lines 1-55).

Although the Examiner acknowledges that Aritani indicates that neither surface of the float glass need by polished prior to or after chemical strengthening (col. 4, lines 6-10), one skilled in the art of manufacturing glass information storage media would recognize that such a preliminary mirror polishing step on at least one surface of the Aritani substrate is a prerequisite to using said substrates as electronic storage media in the manner envisioned by Aritani (col. 1, lines 55-col.2, line 2). That is, while neither surface of the Aritani substrate need be polished in order to achieve the decreased warp benefits of the Aritani strengthening process, a skilled practitioner would recognize that, as produced, float glass does not necessarily have either the planarity or surface smoothness for application as information storage media absent a surface planarization and mirror polishing step.

It is therefore the Examiners' assessment, particularly in view of the Lenhart disclosure, that one skilled in the art of manufacturing glass information storage discs would have found it obvious to mirror polish at least one surface of the Aritani substrate prior to chemical strengthening.

Response to Arguments

Applicant's arguments with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON L. LAZORCIK whose telephone number is (571)272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Daniels can be reached on (571) 272-2450. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason L Lazorcik/
Primary Examiner, Art Unit 1741